As a reviewer, one often receives research papers that are messy, sentences lack a clear structure and there is a lack of desirable flow of unifying thought. It is hard to go through such papers. Often research papers get rejected because of their poor prose.

A research paper is essentially made of two components. The undeniable first is that it should contain new scientific information. The second and equally important component is that the text needs to be easy to read. Readable prose means that the reader — for whom the paper is intended — would be comfortable while reading the paper. Any discomfort experienced by the reader will make him/her dump the paper discontinuing reading.

The key secondary purposes of a paper, therefore, are: (1) ensuring the reader’s comfort and (2) enabling the reader to read the paper to the end. These purposes are lost when we write badly. I will not speak on the quality of science here but will refer to six basic requirements, which I believe are vitally necessary for developing a pleasant and readable text.

The Six Requirements

**Sensitivity of Grammar**

It will be great, if we mastered every rule stated and understood the examples cited in Wren & Martin’s *High School Grammar and Composition* first published in India in 1935. But modern English-language specialists indicate that such mastery is not essential for people such as us, who use English as the second language and to communicate our findings.

It will be, however, important and useful if we know the style in which English is spoken and written by native speakers of English. We need to know, recognise, and validate that we need to speak and write correctly and well. How to do this? Regular reading of popular magazines and quality newspapers will reasonably empower us with standard and popular words and expressions. This practice will enable us to re-use them appropriately in scientific texts.

Most importantly, an extensive reading of quality materials (e.g., novels and non-fiction written by established writers) will train us to think in English directly and provide us with the skill to develop a sensitivity of grammar.

Thinking in our respective mother tongues and translating the composed texts into English will not only be faulty, but will also generally push us into a bottomless pit of errors. One common erroneous expression often used in India that quickly comes to my mind is the use of ‘to give an exam’, which I realise translates from the equivalent Hindi expression. The accepted British English use will be ‘to sit an exam’ or ‘to take an exam’. Examples: ‘I sat my Chemistry exam this morning’, ‘I will be taking my Chemistry exam tomorrow’.

Another common error is the use of ‘firstly’ when we list more than one item in a sequence. The preferred use will be ‘first’ and not ‘firstly’, since ‘first’ serves both as a noun and an adverb. ‘Secondly’, ‘thirdly’, up to ‘fourthly’ are presently accepted, but not beyond, since ‘fifthly’, ‘sixthly’, ‘seventhly’ read awkwardly.

The other common error is the way we write ‘up to’, which is a two-word preposition and not one. We confuse ourselves reading ‘into’ (a one-word preposition), which sounds similar to ‘up to’. This error is perpetuated, unfortunately, even by prominent writers and English newspapers in India.

**Write Logically using Short, Crisp Sentences**

What we want to say in a science paper needs to be thought of in advance. Note that I have used here two prepositions, ‘of’ and ‘in’ in succession. This became necessary because ‘of’ qualifies ‘thought’ and ‘in’ validates ‘advance’.

Thoughts phrased as short and crisp sentences are better than long and winding sentences. Most of us think that proficiency of English is better demonstrated only when we either speak or write long, winding and complex sentences that would include multiple subsidiary clauses. For an elegant prose that is definitely not an option.

Some of the best and most popular, recent-time Indian authors who wrote elegant English were R.K. Narayan, Jawaharlal Nehru, and C. Rajagopalachari, who always wrote short, few-worded sentences. But they skilfully and craftily chose appropriate words. Writing short sentences is an expression of prudence. This is one reason why the late R.K. Narayan, even today, has a large following in English-speaking nations.
When it comes to science and scientific reporting, one other element overrides writing short sentences: the ability to arrange the points logically. Logical presentation is vital to any prose; but it is all the more important in science and its reporting, since logic drives science.

The other suggestion will be to minimise the use of passive voice. Contemporary writing style prefers using active-voice sentences, since such sentences are more straightforward than passive-voice sentences, briefer than the passive-voice sentences at least by a few words, and generally active-voice sentences offer a tone of ownership.

Brevity Important, Clarity More Important

One other requirement in scientific writing is to ‘remain brief’. ‘Brevity’ arises from ‘to the brief’, ‘to being brief’. By saying ‘to being brief’, I am alerting that occasionally the use of ‘continuous’ verb forms (i.e., verbs ending with ‘ing’) following ‘to’ is accepted as standard. This is gerund usage; gerund is a verb that operates similar to a noun and is a valuable tool in science reporting.

The trait of brevity differs appreciably from the reports written in Humanities and other Arts (e.g., History), which generally require extensive, lengthy circumscriptive notes. In science reporting, we need to think precisely and write with equal precision. In journal papers, a contextual explanation is of course essential. Otherwise, the readers will be lost not knowing what they are reading about. But the contents of the context need to be short and to the point. Thinking and writing briefly are excellent, as long as the intended message and its purpose are clear. The message here, therefore, is that the text should be crystal clear to the reader. Clarity takes greater priority than brevity.

This will lead us to another related point. For the sake of clarity, we should not be wordy. Some editors refer to this as verbosity. Being wordy means using words that are beyond necessity. For instance, we liberally use ‘in order to’ (subordinate conjunction) in contexts of justification. Many people use ‘in order to’ in well-written texts. However, contemporary language specialists indicate that this word string can be said powerfully, by only using ‘to’. See the following example: ‘In order to catch the plane at 5 AM, John woke up at 3 AM’. Now read the same sentence without ‘in’ and ‘order’: ‘To catch the plane at 5 AM, John woke up at 3 AM’. The message is absolutely clear in the second example which avoids the use of ‘in’ and ‘order’.

Repeated loud reading of the composed text will often enable us to identify wordiness, and edit it to be short and sweet.

Use Simple Words, Preferably of English (Anglo-Saxon) Roots

One other common trait is to display our command of a powerful and extensive vocabulary. We have a tendency to use complex words of Greco-Latin roots, instead of using equivalent and simple English words, which are known to many. For example, ‘embellish’ that derives from the archaic French word *embellis*, which, in turn, derives from the Latin term *bellus*, which means handsome, beautiful. The equivalent terms would be beautify and decorate.

Better to minimise such non-English terms in scientific texts. Some of the biology texts necessarily require the use of words of Greco-Latin roots; in such contexts, use of non-English terms, those of Greco-Latin roots cannot be avoided.

Spelling and Grammar


The interesting commonality here is that Britain, America, and Australia speak and write English. These dictionaries dictate not only the spellings but also, to a subtle extent, aspects of grammar. The most acceptable option in India would be to follow the Oxford.

Nevertheless, with the world shrinking, in a metaphorical sense, an author of a scientific paper needs to consider where the paper is being submitted: if in Britain and India follow the Oxford, in America follow Merriam–Webster, and in Australia follow the Macquarie. Usually, in the home page of every journal the journal managers clarify the style they prefer for spellings and grammar. This instruction needs to be carefully followed while writing and submitting a manuscript. Most importantly, we need to keep in mind that we cannot afford to mix either spellings or grammar followed in native English speaking nations. The above also reinforces that consistency in style is key in language use.

Use Correct Punctuation Symbols

An unpunctuated text, or a badly punctuated one, is similar to verbal diarrhoea. We need to use the correct punctuation symbol to relay the intended message clearly. For example, misplaced commas convey wrong messages.

One common error we generally make is interchanging semicolons (;) and colons (:) in a sentence. A semicolon functions similar to a full stop, but the advantage of using a semicolon is that we do not need to repeat the subject in the immediately following sentence. This is a handy item in effective writing. A colon, on the other hand, usually precedes a list.

Use of double and single quote marks is messy even among the native English speakers; none is generally clear on the difference between their uses. Therefore, I will suggest that we should reserve the use of double quotation marks (“…” or ‘…”’) at places where we quote a passage from another person’s text. In such contexts, the convention is to include pagination details of the direct quotation along with other in-text reference details, such as the name of the author and the year of publication. In
we need to keep in mind that we cannot afford to mix either spellings or grammar followed in native English speaking nations.

contrast, single quotation marks (‘…’) can be used where we want to emphasise either a word or a string of words, in terms of their importance or to imply pun.

A Few Examples of Common Erroneous Uses of English Words and Phrases in Our Writing

Use of ‘look forward to’: In this elegant phrase, which politely and formally implies that we are eager to do something, the ‘to’ is always followed by a verb in its ‘ing’ form: e.g., ‘I look forward to meeting you soon’.

Use of Definite and Indefinite Articles: This is difficult to explain since this generally evolves out of usage. Nevertheless, use of the indefinite article ‘an’ is generally indicated to appear before a word that starts with a vowel (e.g., a, e, i, o, u): e.g., ‘an apple’, ‘an egg’, ‘an ink jar’, ‘an owl’, and ‘an umbrella’. But remember if we were to refer to one hour in a vague sense, then it is definitely ‘an hour’. The oddity here is the word starts with a consonant ‘h’ but we use ‘an’ before it; the logic here is the letter ‘h’ is mute and technically the word reads as (h) our. So, ‘an’ qualifies ‘(h)our’. One other example will be ‘an SEM image’ and ‘a scanning-electron microscope image’. In the former example, ‘an’ takes precedence because we read ‘s’ as ‘es’; hence ‘an SEM image’.

Use of its and it’s: ‘Its’ implies possessive usage (e.g., its tail, its horns), whereas <it’s> is a contraction for ‘it is’. I have used a pair of single guillemets (‘<’, ‘>’). I could have used single quotation marks (‘,’). The reason is that I have used the single quote mark as an apostrophe to separate ‘it’ and ‘s’. So I have used the single guillemets to highlight <it’s> and also not to confuse the reader with too many single quote marks in succession. The possessive usage ‘its’ is similar to the use of ‘yours’ in ‘yours sincerely’, where we do not use an apostrophe.

Apparently Similar-sounding Words: Words such as ‘accept’ and ‘except’, ‘adapt’ and ‘adopt’ exist and these words mean differently. Look at the following examples: ‘John accepted the job offer made at the post office.’ ‘Except one, all others enjoyed themselves at the party.’ ‘The weather in Canada was harsh when John arrived in December, but he adapted himself to it soon.’ Since John liked the music scored by Joseph for a different song, John adopted the tune set by Joseph for the song he scored.’ ‘Advice’ and ‘advise’ have different functions in a sentence: the first functions as a noun, whereas the second as a verb. Americans write the other way: advice as a verb and advise as a noun.

Collective Nouns: For nouns such as ‘furniture’, ‘equipment’, and ‘luggage’ the plural forms are the same. We cannot write them as ‘furnitures’, ‘equipments’, and ‘luggage’s’. Some such nouns are treated as collective nouns, for which refer to a standard grammar book.

Useless Words: I consider et cetera (usually written as ‘etc.’) and the qualifier ‘very’ useless words in our contemporary scientific English use. People liberaly attach ‘etc.’ at the end of a list, imagining that the reader will know what the writer has in mind, which is impossible. Therefore, better to avoid ‘etc.’ and list the intended items fully. In a similar tone, the qualifier ‘very’ is another meaningless term in scientific parlance. How can one differentiate between ‘long’ and ‘very long’, unless the writer clarifies with datasets explaining long and very long?

To Conclude
Style refers to the way we express ourselves in writing. No single standard dictates style, which writers have to follow. Different styles interest readers; variety fascinates. Nonetheless, two key items – readability and elegance – characterise effective writing style. Good style communicates information effectively. It moves the reader along easily from word to word, sentence to sentence, paragraph to paragraph, and one section of the paper to the next. Bad style frustrates and more often confuses.

Further to the six requirements outlined above, for achieving easy readability of manuscripts, we need to develop the practice of subjecting pre-final drafts to reading by experienced scientists, who can not only offer remarks on the science, but also advice on the quality of language used.

The intent of this article is only to awaken and stimulate the sensitivity that the language used in scientific papers too has a key purpose, which is nearly equal in importance to the reported science. When our awareness of that sense of purpose enhances, then we would naturally take more care to present papers in readable and graceful prose.

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